County of Clarendon
Eight Hour Average Ground Level Ozone
Management and Abatement Program

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Contents

1. Introduction

While ozone is known to be a helpful and protective compound in the upper atmosphere, the harmful effects of ozone are realized at ground level. The purpose of this document is to outline the local program needed to address the levels of ozone at ground level.

a. Legislative Mandate

In an effort to protect the health of the public, the Environmental Protection Agency, as directed under the United States Clean Air Act amendments, has reexamined the statutory requirements for attainment of air quality with respect to ozone. Previous attainment levels have been based on a one hour ground level average. New standards address the ground level value based on an eight hour average. This new value will have a more pronounced impact on areas previously in attainment for ozone, causing them to fall into non-attainment of the National Ambient Air Quality Standards.

b. Establishment of Local Programs

The timing for implementation of the new standard will provide a potential advantage in that areas subject to non-attainment, being presently in attainment, can be made to regulate or otherwise control ozone levels before the new standard is implemented. To accomplish this regulation, county governments are proceeding in a cooperative manner with the primacy agency, the South Carolina Department of Health and Environmental Control (hereinafter, the Department), to establish local programs to reduce ozone levels so that attainment is achieved prior to the implementation of the new standard. The participation in this action is voluntary; however, the potential penalties for non-attainment make this desirable. Clarendon County, with forty-four other counties in South Carolina, has agreed to establish such a program.

2. Ozone as an Air Pollutant

a. Significance of Ozone in the Atmosphere

Ozone surrounds the Earth where it attenuates ultra-violet light waves. Light waves at these energies have been linked to the incidence of skin cancer in humans and other lesser effects manifested by ultra-violet waves acting as ionizing radiation. At ground levels, however, the presence of ozone leads to stressful conditions in the human respiratory tract and may affect, or increase, pulmonary disease symptoms. Receptors of ozone at ground level react to the oxidant character of ozone similarly to oxidizers such as chlorine or bromine.

b. Sources of Ozone at Ground Level

Ozone is produced by reactions of volatile organic chemicals or oxides of nitrogen with elemental oxygen. Organics are available from a wide range of sources. Volatile organics may emanate from industrial releases as well as fuel product vapors escaping during fuel transfer operations. Oxides of nitrogen occur in fossil fuel combustion and open burning. Low efficiency combustion can likewise release volatile compounds. While the reaction cannot be regulated, the presence of precursor reactants can. Such is the guide for development of a local control plan.

3. Current Conditions in the County

a. Incidence of Health Effects

1. County Health Officials

In conversation with the County Nursing Supervisor for the Department, the incidence and trends in pulmonary health were discussed. Currently, specific pulmonary health problems have not been recognized as aggravated specifically by levels of ozone.

2. Air Quality Bureau District Representative

In discussion with the Department's Air Quality Bureau representative, no indication was made that Clarendon County is in jeopardy of slipping into non-attainment. Non-attainment would include potential loss of Federal Highway funds and other Federal funds unless acceptable abatement plans and the necessary local legislation are in place with an appropriate schedule of compliance to be established and followed. A coincidental effect is an increase in the scrutiny applied to new air emission permits for industrial concerns.

b. Development and Air Pollution

1. Rural Areas

Clarendon County is composed largely of rural and agrarian areas. Today, the agricultural lands are finding more usage as forest lands for pulp and lumber trees. An increasing presence of large animal impoundments has also been noted. Other areas in the rural setting are composed largely of swamp land which provides some logging interests, hunting lands, and otherwise lands not disposed to popular development.

The routine compliment of farm products is used where cotton, tobacco, and grains are grown. Farm implements generally employ diesel power for planting, treatment, and harvesting. A common practice in the farming community is to burn field stubble over large areas. Controlled burns of forest management are not common today. Except during air inversions, it is typical that any fumes, smoke, or vapors are widely dispersed and quickly dissipated.

2. Municipal and Transportation

Clarendon County has three primary municipal areas: Turbeville, Manning, and Summerton. There are other smaller communities but none exhibit the same municipal character. Each of these municipalities is characterized by the intersection of major public highways carrying large numbers of vehicles in private and commercial service. The largest of these, Manning, lies at the intersection of I-95 and Highway 261. This represents a primary interstate north-south route and a primary route component from Columbia to Charleston, Georgetown, and Myrtle Beach. Along Highway 261, a large percentage of traffic is not local. It is typical that both gasoline and diesel vehicles in large numbers move directly through the town as no bypass roads exist. Traffic from I-95 runs approximately three miles west of Manning, north and south. It is reasonable to believe the environment becomes more stressful with respect to auto emissions and air quality in these settings, especially during air inversions. However, no known effects have been in evidence by demonstration of health officials.

3. Industrial Development

Clarendon County has enjoyed constant, though limited industrial growth. The nature of industry is oriented toward assembly and fabrication from forged parts. Only limited chemical treatments or coatings are used. There are no industries that are wet chemical process based. Fossil fuel (heating oil, coal or wood waste) heating systems are utilized to supply power in a number of cases.

4. Geographic Aspects

The County is located on the western edge of the Coastal Plain. This is characterized by flat, wet lands mixed with drier sand or clay type soils with heavy vegetation. Having the absence of deep, pronounced valleys, winds provide for swift dissipation of air pollutants. As one moves away from the population centers, sources also are more dispersed geographically. One might reason that the Santee River valley is a significant feature. However, Lake Marion is large enough to influence convective air currents during times of concern which can dissipate ozone accumulation at ground level.

5. Prospective Changes

Clarendon County continues to grow as a retirement community, residential area and recreational area in the vicinity of Lake Marion. Residential growth in other parts of the County has likewise been noted. With the current economic setting, industrial growth is continuing slowly.

4. Local Control Measures

a. Efforts by Municipal and County Government

Municipal and county governments maintain fleets of vehicles to provide public services. This is probably the largest source of precursor materials which may be controlled. Controls may take the form of:

i. Seeking replacement vehicles with better combustion efficiency.
ii. Scheduling maintenance to keep existing fleet vehicles in good running order and running efficiently.
iii. Providing employees with information which would increase vehicle efficiency by adjusting driving habits.
iv. Examining the nature of fuels used for cleaner burning.
v. Encouraging carpooling on the job where tasks overlap.

b. Efforts by Developers and Agriculture

Developers and agronomists have similar activities relative to ozone controls. Land clearing and disposal of waste materials are related to both. In order to favorably influence ozone precursor production the following may be employed:

i. Disposing of waste building materials at an appropriate landfill rather burning materials at the building site.
ii. Conducting open burning for land clearing on days when atmospheric conditions are favorable for dispersion of smoke and fumes.
iii. Disposing of land clearing waste in an appropriate landfill where practical.
iv. Burning of field stubble, toppings from crop trees, and control burns during favorable atmospheric conditions.

c. Efforts Relating to Transportation

In an overall approach to transportation, it is believed that there are limited means to affect the transient vehicles in the County. A good approach otherwise is to encourage the participation of County residents by encouraging themes similar to those of the governmental sector.

d. Education and Personal Efforts

The most important aspects of the ozone reduction actions in the County are those of education. It is held that widespread knowledge of the ozone problem is limited. Therefore, all citizens should be made aware of the problem and of actions available to citizens to assist the community. These may take the form of:

i. News articles in local newspapers centered on the need for continued compliance with the ambient air standards.
ii. Encouraging schools to incorporate air pollution, its effects, and its solutions into science curricula at the middle and high school levels.
iii. Providing information through county agencies such as the NRCS and Clemson University Extension.
iv. Posting information encouraging the public to efficiently operate motor vehicles and maintain them in good condition as a service to the community and themselves. Such a notice might even be posted in service stations to be noticeable when individuals frequent the establishment.

e. Local Authority

The County will, in order to act as an official source of information, designate a person or office to follow air quality information. This includes information issued by the Bureau of Air Quality regarding ozone levels, air alerts, burning bans and the like. Much information of this nature is available over the Internet from the Department. This official can also act as a notification point for residents to report air quality problems. Using this information, compliance with county control measures can be tracked.

5. Cooperative Efforts with SCDHEC

a. Air Quality Modeling

The South Carolina Department of Health And Environmental Control is undertaking the administration of the program through agreements with the Environmental Protection agency. The Department is also undertaking state air quality modeling to predict current and future trends in ozone levels.

b. Advancement of Local Plans with State Directions

The Department, through its administration of the air quality program, will review the submitted plans and guide regulated groups toward program development capable of meeting the ozone requirements of 2007. The Department also acts as a buffer between the USEPA and these groups. By filling this position, the Department is able to tailor the US law to the needs of the state and provide necessary assistance.

c. Routine Reviews

The SCDHEC Bureau of Air Quality continues to process permits for industrial ambient air discharges. In light of the revision of the Air Quality laws and regulations more attention will be give to discharge of materials which could affect local ozone concentrations in addition of the normal range of reviews.

6. Conclusions

a. Implementation Practices

In order to comply with the needs of the coming regulations, the State of South Carolina has arranged this method of maintaining, or achieving compliance with the future US regulatory requirements. This plan and report is offered to demonstrate that no immediate ozone non-attainment is expected in Clarendon County. However, this does not guarantee that inaction will be adequate to maintain this condition. Therefore, it is recommended that political bodies in the county review these recommendations and work to implement as many as feasible prior to the target date. To proceed this way is not only a benefit to the community but a means of defending the County's freedom from the yoke of unnecessary regulation. It is also a means of self defense against problems which may impinge on the county through fallout from adjacent counties.

b. Implementation Schedule

The County has until 2007 to fully implement an acceptable program for ozone reduction. The Department has established various milestones toward this goal. A proposed schedule of compliance is provided in the Appendix along with comments regarding certain current County Council actions relating to the program.

7. Appendix

1. Map of Areas Potentially in Non-Compliance by Current Analysis

2. South Carolina's Early Action Plan for the Eight Hour Ozone Standard
   Fact Sheet, August 2002

3. South Carolina's Compliance with the National 8-Hour Ozone Standard and
   Recommended Action Steps to Attain and Maintain Compliance with this
   Standard, 31 March 2003, SCDHEC

4. South Carolina's Eight Hour Early Action Ozone Compact, 12 December 2002

5. South Carolina Department of Health and Environmental Control Early Action
   State Plan Implementation Plan Attachment 3

6. a. Area Map showing Major Roadways
   b. Manning Vicinity Map

7. Pertinent Pages from USEPA and SCDHEC Publications Concerning Air Pollution

   a. Asthma in Clarendon County, May 2002, by SCDHEC
   b. Ozone and Your Health, September 1999, by USEPA
   c. Regional Approaches to Improving Air quality, May 1997, by USEPA
   d. Smog – Who Does It Hurt? What You Need to know about Ozone and Your
      Health, July 1999, by USEPA

8. Proposed Schedule of Compliance

   1. Investigation of County owned vehicle inventory
      Development of policies for operation and maintenance

   2. Investigate School District vehicle inventory
      Develop policies for operation and maintenance
      Investigate science curricula at Middle and High School levels
      Develop air pollution components for school curricula
      Negotiate Memorandum of Agreement with School districts

   3. Establish local air quality information contact
      Develop public information outlets

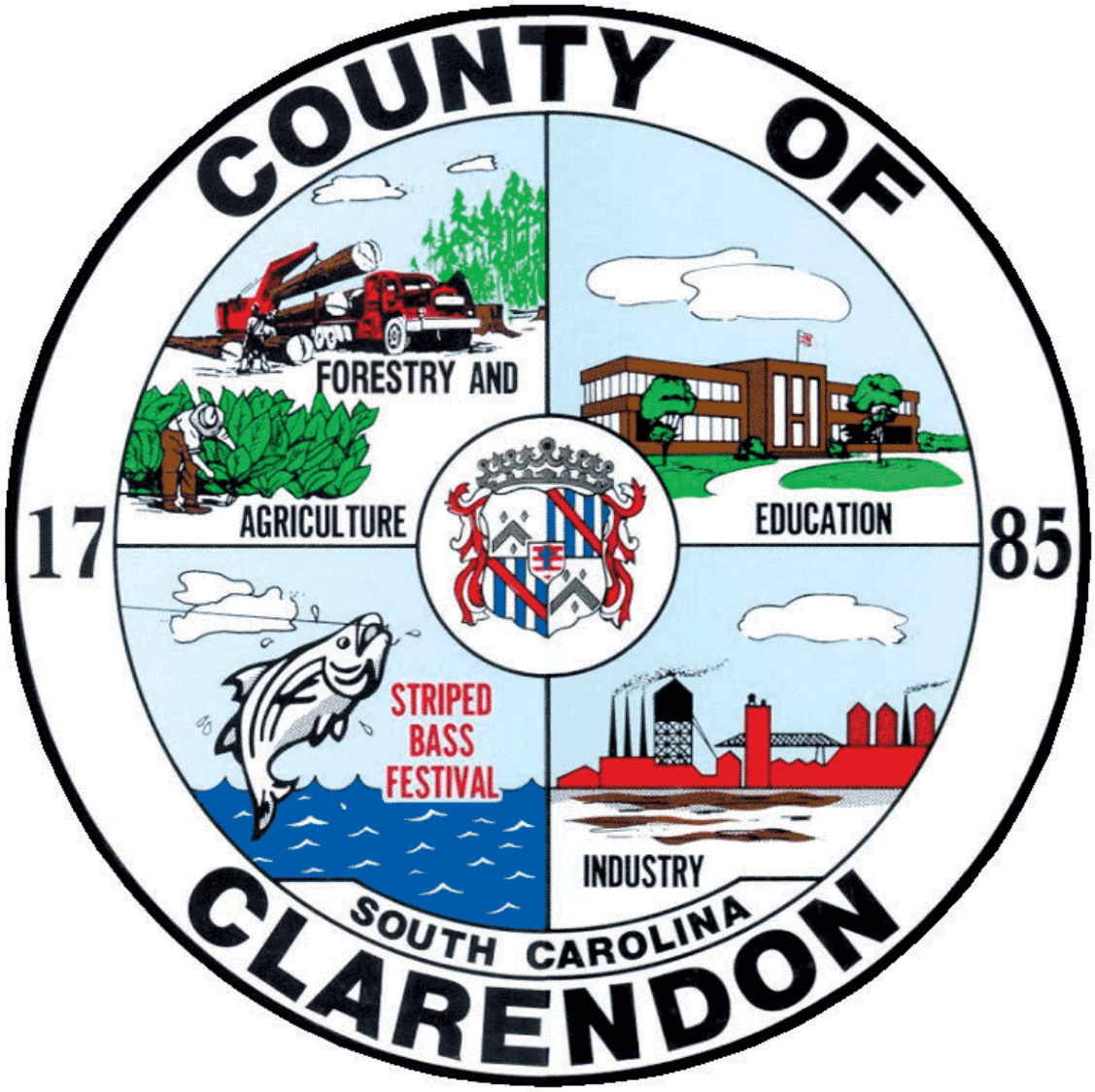
4. Develop policies for open burning
   Develop policies for combustion vehicle operation

5. Submit policy information as addenda to final Early Action Plan submittal

6. Make semi-annual report to the Bureau of Air Quality regarding progress of program development with attention toward 1 April 2004 implementation date.

9. Involvement of Clarendon County

The overall purpose of the early action plan within Clarendon County is to look forward with caution to the possibility of coming into noncompliance with the National Ambient Air Quality Standards. At this time, there is no information to suggest that non-compliance is imminent. However, failure to plan to a reasonable degree may prove inconvenient at a future date. On 8 March 2004, the County Council adopted this plan as the recommended policy toward ozone abatement. The Council will be kept apprized of the plan development and invited to discuss or sanction elements or all the material in the plan.



EIGHT HOUR AVERAGE GROUND LEVEL OZONE MANAGEMENT AND ABATEMENT PLAN